Metrorail Passenger Loads

Metrorail passenger loads by line within the study area were obtained from WMATA for the busiest segment of each line during the AM peak hour and PM peak hour. Refer to section 3.10.4.3 for further details on how Metrorail passenger loads were calculated. Projections for 2025 used projected trips associated with the City Center and Old Post Office projects and the regional Metrorail growth rate (2.1 percent annually).

Current (2014) passenger loads and projected passenger loads by 2025 are all below 120 passengers per car, or what WMATA considers to be capacity. All trains were assumed to have six cars with the exception of Blue line trains, which typically have eight during peak periods (WMATA 2014g). Tables 4-35 and 4-36 summarize passenger loads per car between 2014 and 2025 during the AM peak hour and PM peak hour. No-action Alternative background growth trips are shown separately from the planned development projects to show the incremental impact of each component.

Table 4-35: JEH Parcel Current and Projected AM Peak Hour Maximum Metrorail Passenger Loads by Line

Line	Segment	Train Cars	2014 Existing		2025 No-action Alternative Background Growth		2025 No-action with Planned Development Projects	
			Pax	Load	Pax	Load	Pax	Load
Red	Gallery Place to Metro Center	136	9,125	67.1	11,434	84.1	11,651	85.7
Orange	Smithsonian to Federal Triangle	94	5,870	62.4	7,355	78.2	7,495	79.7
Green	Mt. Vernon Square to Gallery Place	68	3,542	52.1	4,438	65.3	4,522	66.5
Yellow	L'Enfant Plaza to Archives	78	3,058	39.2	3,832	49.1	3,904	50.1
Blue	Smithsonian to Federal Triangle	44	1,691	38.4	2,119	48.2	2,159	49.1

Note: Pax = passengers, Load = number of passengers per Metrorail car
Source: WMATA (2014h); GS (2008); GSA in cooperation with NCPC (2013a)

Table 4-36: JEH Parcel Current and Projected PM Peak Hour Maximum Metrorail Passenger Loads by Line

Line	Segment	Train Cars	2014 Existing		2025 No-action Alternative Background Growth		2025 No-action with Planned Development Projects	
			Pax	Load	Pax	Load	Pax	Load
Red	Metro Center to Gallery Place	142	10,614	74.7	13,300	93.7	13,605	95.8
Blue	Federal Triangle to Smithsonian	42	2,448	58.3	3,067	73.0	3,138	74.7
Green	Gallery Place to Mt Vernon Square	70	4,034	57.6	5,055	72.2	5,171	73.9
Orange	Metro Center to McPherson Square	114	6,417	56.3	8,041	70.5	8,225	72.1
Yellow	Archives to L'Enfant Plaza	78	3,588	46.0	4,496	57.6	4,599	59.0

Note: Pax = passengers, Load = number of passengers per Metrorail car
Source: WMATA (2014h); GS (2008); GSA in cooperation with NCPC (2013a)

Table 4-37: JEH Parcel Weekday Peak 15-Minute Exiting Period Ridership Growth

Metro Station	Time	2014		2025	
		Entries	Exits	Entries	Exits
Archives	8:45 AM – 9:00 AM	25	524	46	670
Federal Triangle	8:45 AM – 9:00 AM	15	467	28	597
Gallery Place East	6:15 PM – 6:30 PM	212	355	266	445
Gallery Place West	8:45 AM – 9:00 AM	12	301	15	378
Metro Center East	8:45 AM – 9:00 AM	44	434	55	544
Metro Center South	8:45 AM – 9:00 AM	20	427	36	546

Sources: WMATA (2014d); MWCOG (2015); GS (2008); GSA in cooperation with NCPC (2013a)

Table 4-38: JEH Parcel Weekday Peak 15-Minute Entering Period Platform Ridership Growth

Metro Station	Time	2014		2025	
		Entries	Exits	Entries	Exits
Archives	5:00 PM – 5:15 PM	524	56	665	77
Federal Triangle	5:00 PM – 5:15 PM	501	38	635	55
Gallery Place--Glenmont	5:00 PM – 5:15 PM	641	975	807	1,220
Gallery Place--Shady Grove	5:00 PM – 5:15 PM	1,016	534	1,302	667
Gallery Place--Green/ Yellow	5:00 PM – 5:15 PM	1,629	1,128	2,051	1,436
Metro Center--Glenmont	5:30 PM – 5:45 PM	1,171	548	1,472	680
Metro Center--Shady Grove	5:30 PM – 5:45 PM	1,183	691	1,490	859
Metro Center--Blue/ Orange/Silver	5:30 PM – 5:45 PM	1,618	1,651	2,044	2,078

Source: WMATA (2014d); MWCOG (2015); GS (2008); GSA in cooperation with NCPC (2013a)

Station Capacity Analysis

Section 3.10.4.3 contains an in-depth description of the Metrorail station capacity analysis methods. A capacity analysis was conducted for the vertical elements (escalators and stairs), faregate aisles, fare vending machines, and platforms at Archives-Navy Memorial and Federal Triangle Metro Stations, as well as the south and east entrances to Metro Center and the east and west entrances at Gallery Place-Chinatown (the closest entrances to the JEH building). The analysis used peak 15-minute periods of ridership (entries and exits) at each station according to projected 2025 No-action Alternative ridership. No-action Alternative 2025 ridership includes the City Center and Old Post Office development trips and predicted regional transit growth. Analysis for vertical elements, and faregate aisles used projected ridership from the peak exiting period at each station entrance. Table 4-37 summarizes ridership growth during the peak exiting periods at each station entrance.

The platform area analysis and fare vending machine analysis used projected ridership from the peak entering period at each station. Table 4-38 summarizes ridership growth during the peak entering period at each station platform (for peak entering period ridership by station entrance, see Fare Vending Machine sections in Appendix B).

Overall, vertical elements and faregate aisles at each station are projected to operate below a v/c of 0.7, which is considered under capacity. Fare vending machines are projected to operate above capacity at Archives-Navy Memorial, the east and west entrances to Gallery Place-Chinatown, and the east and south entrances to Metro Center. WMATA's Momentum Plan, the agency's strategic plan for the future, does not include any mention of proposed additions to fare vending machines within the system (WMATA 2014a).

Platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to be at the acceptable level of B at Archives-Navy Memorial and Federal Triangle. The Red Line platforms at Gallery Place-Chinatown and Metro Center are all projected to operate at a pedestrian LOS D, while the lower platforms are projected to operate at pedestrian LOS C. At pedestrian LOS D, passengers would likely begin to spread out farther up and down the platform. Further details on the station capacity analysis are found in JEH TIA (Appendix B).

An emergency evacuation analysis was performed for each study area Metro station to evaluate evacuation capacities and procedures; WMATA typically performs this analysis for all its station capacity analysis studies. The results of the analysis are included in the "Results of Transit" section, and complete details on the emergency evacuation analysis are found in the JEH TIA (Appendix B).

Metrobus Analysis

For this analysis, it is assumed that there would be no major changes in Metrobus service in the study area by 2025. The 2025 No-action Alternative peak hour bus volumes were calculated by:

- averaging existing maximum weekday passenger loads for each route and direction at stops within the study area by stop;
- multiplying the passenger load by the number of AM peak hour and PM peak hour trips to calculate ridership per peak hour by route and direction; and
- growing the resulting ridership totals to 2025 using the regional bus growth rate of 1.9 percent.

These totals were then summed to calculate a total ridership per peak hour for the study area. To calculate the AM peak hour and PM peak hour capacity of bus services within the study area, the capacity per trip of each Metrobus route during each peak hour was multiplied by the number of trips scheduled in each peak hour. Capacities per trip for each Metrobus route were based on the typical number of seats available on each trip and the WMATA load standard (WMATA 2013e).

Total 2014 AM peak hour bus ridership in the study area was calculated at just more than 4,300 passengers, while PM peak hour bus ridership was calculated at approximately 3,950 passengers. Additional bus trips associated with the CityCenterDC project were added to these 2014 totals, while trips associated with the Old Post Office project were added to 2016 totals (see table 4-39). The trips were added proportionally to each route and direction in the study area based on their share of existing ridership. In combination with the 1.9 percent growth rate, bus passenger volumes in the study area by 2025 are forecasted to be approximately 5,350 during the AM peak hour and nearly 5,000 during the PM peak hour. This is well below the capacity of bus services within the study area, which is approximately 11,400 passengers during the AM peak hour and 10,700 passengers during the PM peak hour. Table 4-40 summarizes current and projected bus ridership in the study area.

While bus capacity in the study area as a whole would be sufficient in 2025, several individual routes would likely experience capacity issues during peak hours. Peak volumes per hour on Routes 11Y, 32, 36, 80, and G8 are all projected to be over capacity by 2025 within the study area. WMATA has completed studies of the 30s Line (Routes 32 and 36), Route 80, and Route G8, according to its website. Certain recommendations from these studies have already been implemented, and all are intended to mitigate overcrowding on these routes. Further analysis would be required to determine the extent to which the recommendations would impact capacity on these routes. Specific recommendations from WMATA's studies to improve bus capacity are found in Appendix B.

With the redevelopment of the Old Post Office site, the selected developer would seek to relocate the bus stop on Pennsylvania Avenue and 12th Street NW directly in front of the main Old Post Office Building entrance farther east, closer to 10th Street (GSA in cooperation with NCPC 2013b). This relocation of the bus stop would reduce existing conflicts between pedestrians, vehicles, and buses by increasing visibility between pedestrians and oncoming traffic and would have an overall beneficial impact by providing better access to crosswalks across Pennsylvania Avenue and 10th Street NW. The Old Post Office redevelopment study provides more details on the existing and proposed conditions at this location.

Table 4-39: Bus Passenger Trips Associated with CityCenterDC and Old Post Office Developments

Project (Year)	Non-SOV AM Peak Hour	Non-SOV PM Peak Hour	Bus Proportion of Non-SOV	Bus AM Peak Hour	Bus PM Peak Hour
CityCenterDC (2014)	679	1,382	6.3%	43	87
Old Post Office (2016)	582	375	6.3%	37	24

Note: Bus passenger trips noted in the table are for the completion year of each project, as noted in parenthesis in the "Project (Year)" column.
Source: WMATA (2014); MWCOG (2015); GS (2008); GSA in cooperation with NCPC (2013a)

Table 4-40: Current and Projected Bus Ridership in the JEH Parcel Study Area

Year	AM Peak Hour			PM Peak Hour		
	Volume	Capacity	V/C	Volume	Capacity	V/C
2014 Existing Condition	4,315	11,425	0.38	3,952	10,698	0.37
2025 with Background Growth	5,288		0.46	4,843		0.45
2025 with Background Growth and Planned Development Projects (Total No-action)	5,383		0.47	4,978		0.47

Source: GS (2008); GSA in cooperation with NCPC (2013a); WMATA Automatic Passenger Counter (APC) Data, March (2014); MWCOG (2015)

JEH PARKING
NO-ACTION ALTERNATIVE
ENVIRONMENTAL CONSEQUENCES SUMMARY

Indirect, long-term, beneficial impacts.

JEH TRUCK ACCESS
NO-ACTION ALTERNATIVE
ENVIRONMENTAL CONSEQUENCES SUMMARY

No measurable impacts.

Table 4-41: JEH Parcel Background Growth Rates for No-action Roadways

Roadway	Annual Growth Rate	Eleven-Year Growth
4th Street NW	0.5%	5.64%
6th Street NW		
9th Street NW		
11th Street NW		
12th Street NW		
13th Street NW		
E Street NW		
H Street NW		

Source: Chamberlain (2014)

Parking

Non-street parking in the study area would increase with the CityCenterDC and the Old Post Office building redevelopment, which would have parking garages of 1,555 and 150 parking spaces, respectively (Development 2013). Although 500 spaces of the City Center parking garage would be open to the public due to the retail use within the project, the Old Post Office building parking would be limited to Old Post Office patrons who use valet as well as up to five employee spaces (CityCenterDC 2014; GSA in coordination with NCPC 2013b). Due to the limited nature of parking at the Old Post Office site, off-street parking conditions would likely only see minor changes from the few employees who may opt to pay for parking at CityCenterDC and walk the remaining blocks to the JEH building.

There are no anticipated changes to street parking within the study area within the timeframe of this study, but several street parking spaces would be added to the CityCenterDC blocks with the reinstatement of the 10th Street and I Street NW rights-of-way as streets. These additional on-street parking spaces would likely be time-constrained and are intended for retail customers, deliveries, and mid-day trips to surrounding commercial buildings.

Under the No-action Alternative, there would be indirect, long-term, beneficial impacts to parking due to an increased supply mainly as a result of the CityCenterDC development project. However, the additional parking may or may not have a negative impact to future traffic (see section 4.2.9.7, Traffic Analysis).

Truck Access

Truck access routes would not change under the No-action Alternative. Therefore, under the No-action Alternative there would be no measurable impacts to truck access.

Traffic Analysis

According to the DDOT scoping form, two primary sources were relied on to develop the future traffic volumes: an approved list of planned developments agreed to by DDOT and background growth rates agreed by all parties (DDOT and the EIS project team). The DDOT scoping form is found in Appendix A.

The following section describes the process for analyzing traffic for the No-action Alternative and the results of the analysis.

DDOT is conducting a citywide traffic signal optimization initiative scheduled to be completed by the end of 2016 (DDOT 2015a). The traffic signals within the study area were not optimized as part of the No-action Alternative because DDOT's signal optimization initiative would cover many areas outside of the JEH traffic study area. The signal optimization study may consider corridor-based signal plans, bus priority corridors, or other methods to improve traffic flow on an area-wide basis that could include the JEH study area.

Background Growth

Refer to section 3.10.4.3 for a detailed description of background growth and how it was calculated. Following DDOT's guidelines, the latest available DDOT historic average daily vehicle counts were compared from 2008-2012 to provide an average annual growth rate to apply to the study area roadways (DDOT 2009b).

The comparison separated roadways into arterials, minor arterials, and local roadways based on DDOT's assigned functional classification map. Arterial and local roadways had an average negative growth while minor arterials had a 0.5 percent positive growth. This information was presented to DDOT, which agreed for the study to apply a 0.5 percent growth for the minor arterials only and a 0 percent growth rate for all other roadways. Based on the DDOT roadway functional classification map, the minor arterials are 4th Street NW, 6th Street NW, 9th Street NW, 11th Street NW, 12th Street NW, 13th Street NW, E Street NW, and H Street NW (DDOT 2014b). The background growth was forecasted out 11 years (future horizon year 2025) by using the compound formula method. Table 4-41 summarizes the background growth rates applied to the study area network.

Trip Generation and Modal Split

The trip generation and modal split process relied on the transportation studies conducted for both development projects, the Old Post Office Renovation and City Center (GSA in cooperation with NCPC 2013a; GS 2008). They both followed the DDOT Guidelines by using the *ITE Trip Generation Manual* trip rates where possible (2012). The *Old Post Office Redevelopment Transportation Study* also referenced the Washington Convention Center EIS to develop trip rates and modal split for the proposed hotel conference center. Both studies relied on the 2005 *WMATA Development-Related Ridership Survey* to determine the percentage of transit trips. The analysis used the full trip generation published in the Old Post Office transportation study, not the net trip generation, because (1) the building probably was not occupied during the time traffic counts for this project were obtained, and (2) the analysis approach was conservative. Table 4-42 presents the planned development generation summary. Appendix B contains the forecasted steps and more detailed trip generation summary.

Trip Distribution

Once the number of trips was forecasted through trip generation, and their mode was projected through the previously discussed studies, destinations of the trips were forecasted. This process followed the two transportation studies (Old Post Office Redevelopment and CityCenterDC). The *Old Post Office Redevelopment Study* distributed the trips based on the existing turning movement pattern (GSA in coordination with NCPC 2013a). The same projected trip pattern was followed. The trips were assumed to continue on the same roadway heading through the study area. The CityCenterDC trip distribution followed the same pattern assigned through the transportation study and was also assumed to continue on the same roadway heading through the study area (GS 2014). Table 4-43 contains the trip distributions covering the two planned developments, and Appendix B contains maps showing the trip distributions for both planned developments.

Development of the No-action Alternative

The planned developments, background growth, and planned roadway improvements were summed together to create the total background trip change between the Existing Condition and the No-action Alternative. Appendix B contains the individual planned developments and background growth total turning movement volumes. The No-action Alternative turning movement vehicle volumes covering all study area intersections are shown in figure 4-33.

Table 4-42: Planned Development Trips for the JEH Parcel No-action Alternative

Project	AM Peak Hour Trips			PM Peak Hour Trips		
	In	Out	Total	In	Out	Total
CityCenterDC*						
TOTAL VEHICLE TRIPS	**337**	**165**	**502**	**261**	**420**	**681**
Old Post Office Redevelopment**						
TOTAL VEHICLE TRIPS	**146**	**112**	**258**	**80**	**97**	**177**

Notes:
**Based on trip generation tables contained in the Technical Memorandum from Gorove Slade Associates to Old Convention Center Site Master Developer dated May 23, 2008 (GS 2008)*
***Based on trip generation tables published in the Old Post Office Redevelopment Transportation Study (GSA in coordination with NCPC 2013a)*

Table 4-43: JEH Parcel No-action Alternative CityCenterDC and Old Post Office Redevelopment Trip Distribution

Destination	Road	CityCenterDC Distribution	Old Post Office Redevelopment Distribution Percent			
		All Conditions	AM Inbound	AM Outbound	PM Inbound	PM Outbound
East DC/MD	Constitution Avenue East	8.0%	17.6%	17.3%	11.4	11.8
North DC	14th Street North	0.0%	8.8%	8.7%	11.4	11.8
Northeast DC/MD	10th Street North	0.0%	3.0%	0.0%	9	0.0
North DC	11th Street North	0.0%	5.9%	6.5%	9.1	23.5
South DC	7th Street South	0.0%	14.7%	1.8%	18.2	5.3
Northwest MD, Western VA	Constitution Avenue West	5.0%	23.5%	39.2%	22.7	29.4
South DC, Southeast MD, Southwest VA	12th Street / 9th Street	12.0%	26.5%	26.5%	18.2	18.2
TOTAL		**24.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Watson (2015)

Figure 4-33: JEH Parcel No-action Alternative AM and PM Weekday Peak Turning Movement Volumes

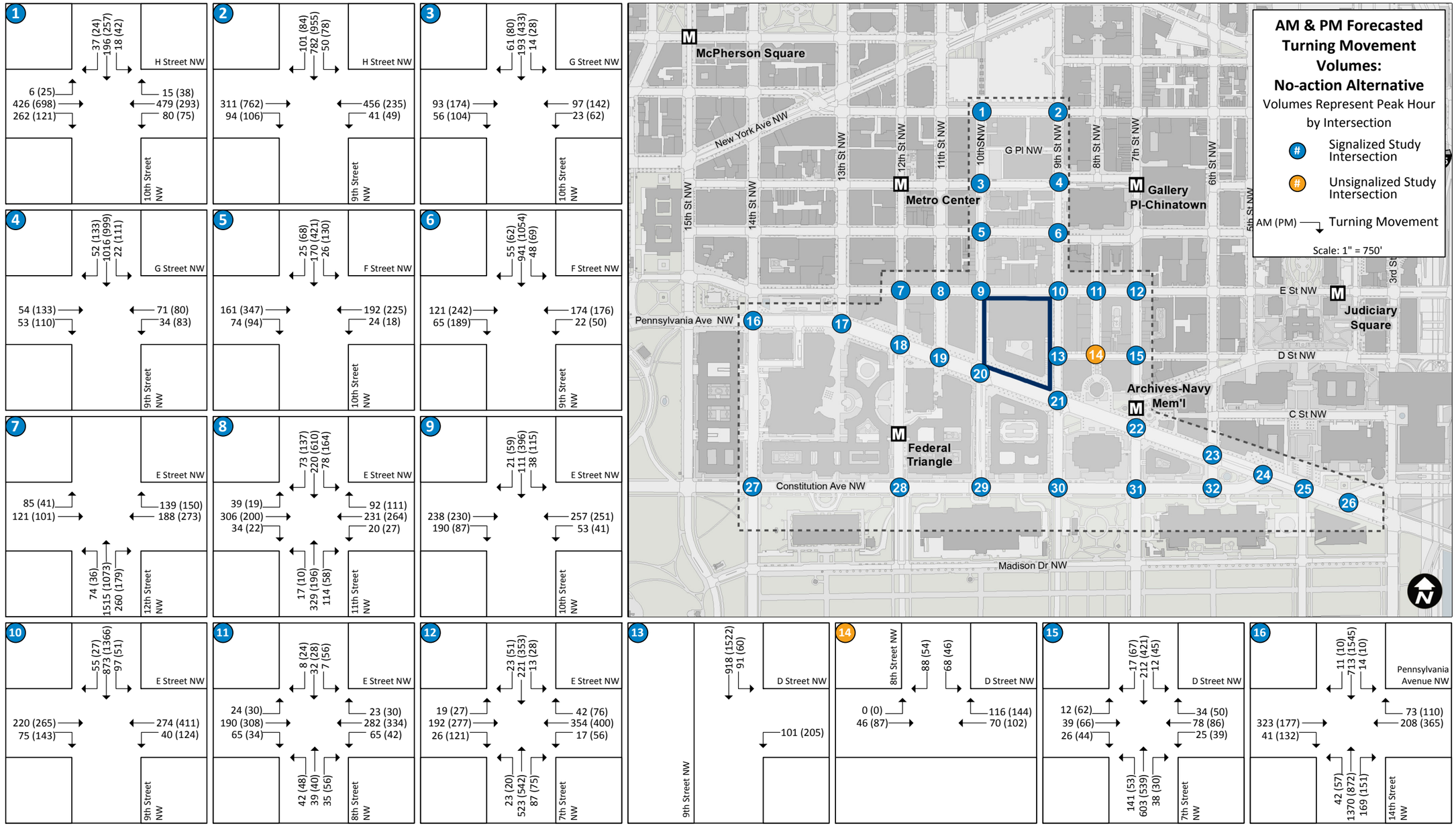
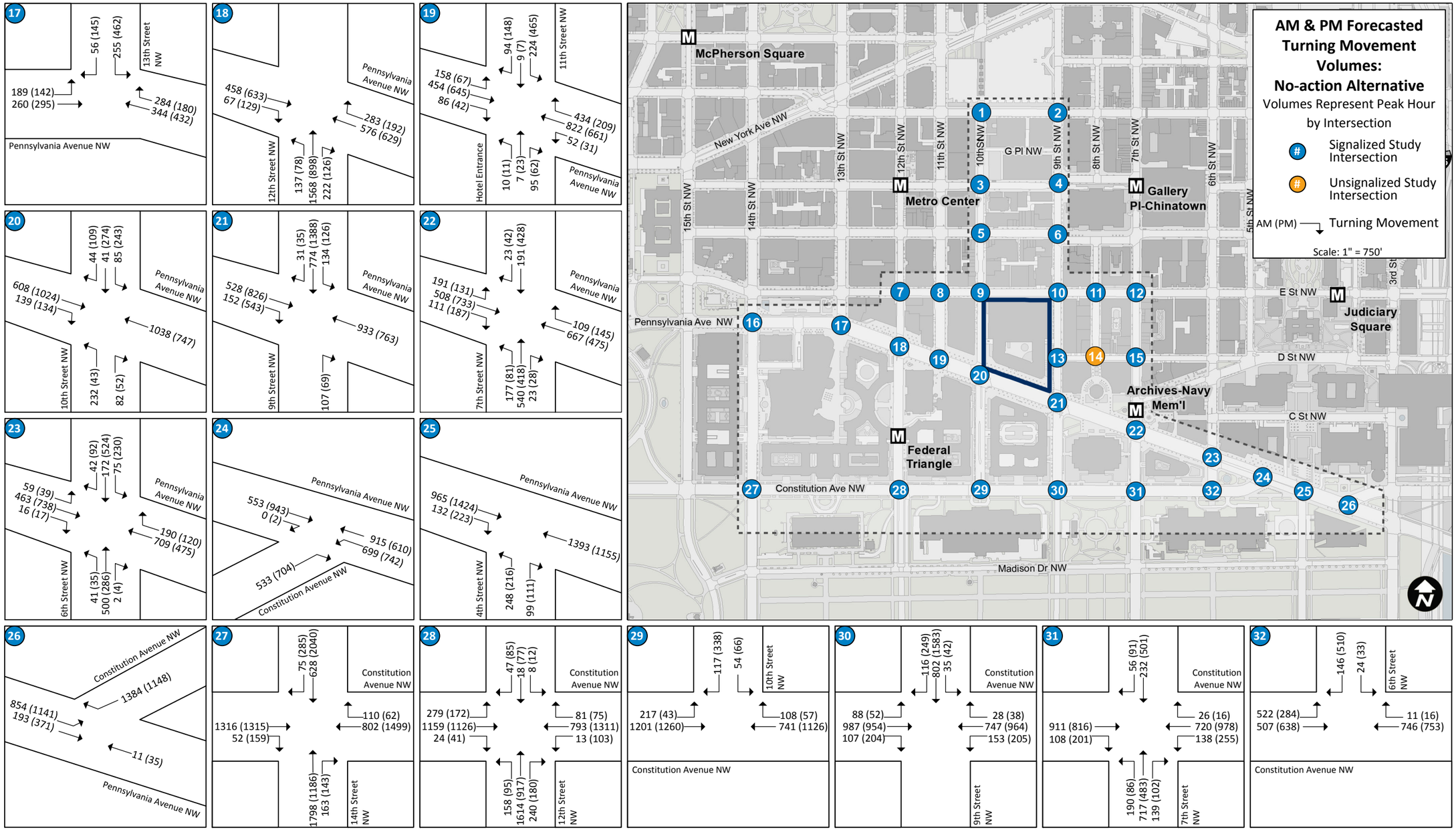


Figure 4-33: JEH Parcel No-action Alternative AM and PM Weekday Peak Turning Movement Volume (continued)



JEH TRAFFIC ANALYSIS NO-ACTION ALTERNATIVE ENVIRONMENTAL CONSEQUENCES SUMMARY

Indirect, long-term, adverse impacts.

Table 4-44: JEH Parcel No-action Alternative AM and PM Peak Hour Operations Analysis

#	Intersection	AM Peak Hour Overall			PM Peak Hour Overall		
		Delay (sec/vehicle)	LOS	Check	Delay (sec/vehicle)	LOS	Check
1	10th Street NW & H Street NW	12.8	B	Pass	19.6	B	Pass
2	9th Street NW & H Street NW	20.3	C	Pass	24.7	C	Pass
3	10th Street NW & G Street NW	14.6	B	Pass	18.2	B	Pass
4	9th Street NW & G Street NW	13.0	B	Pass	45.7	D	Pass
5	10th Street NW & F Street NW	12.1	B	Pass	17.4	B	Pass
6	9th Street NW & F Street NW	9.8	A	Pass	41.5	D	Pass
7	12th Street NW & E Street NW	21.8	C	Pass	26.3	C	Pass
8	11th Street NW & E Street NW	14.7	B	Pass	26.4	C	Pass
9	10th Street NW & E Street NW	8.8	A	Pass	24.8	C	Pass
10	9th Street NW & E Street NW	13.0	B	Pass	46.2	D	Pass
11	8th Street NW & E Street NW	13.7	B	Pass	13.5	B	Pass
12	7th Street NW & E Street NW	19.4	B	Pass	18.7	B	Pass
13	9th Street NW & D Street NW	7.7	A	Pass	8.1	A	Pass
14	8th Street NW & D Street NW (AWSC)	8.2	A	Pass	8.4	A	Pass
15	7th Street NW & D Street NW	38.7	D	Pass	18.2	B	Pass
16	14th Street NW & Pennsylvania Avenue NW	27.3	C	Pass	21.3	C	Pass
17	13th Street NW & Pennsylvania Avenue NW	35.4	D	Pass	25.2	C	Pass
18	12th Street NW & Pennsylvania Avenue NW	32.9	C	Pass	20.1	C	Pass
19	11th Street NW/Hotel Entrance & Pennsylvania Avenue NW (Signalized)	32.8	C	Pass	48.1	D	Pass
20	10th Street NW & Pennsylvania Avenue NW	19.2	B	Pass	16.1	B	Pass
21	9th Street NW & Pennsylvania Avenue NW	12.5	B	Pass	26.8	C	Pass
22	7th Street NW & Pennsylvania Avenue NW	41.8	D	Pass	25.2	C	Pass
23	6th Street NW & Pennsylvania Avenue NW	16.9	B	Pass	57.4	E	Fail
24	Constitution (WB) Avenue NW & Pennsylvania Avenue NW	20.2	C	Pass	36.8	D	Pass
25	4th Street NW & Pennsylvania Avenue NW	10.6	B	Pass	14.2	B	Pass
26	Constitution (EB) Avenue NW & Pennsylvania Avenue NW	18.6	B	Pass	18.5	B	Pass
27	14th Street NW & Constitution Avenue NW	24.4	C	Pass	54.5	D	Pass
28	12th Street NW & Constitution Avenue NW	53.7	D	Pass	31.7	C	Pass
29	10th Street NW & Constitution Avenue NW	14.8	B	Pass	24.7	C	Pass
30	9th Street NW & Constitution Avenue NW	27.3	C	Pass	32.8	C	Pass
31	7th Street NW & Constitution Avenue NW	17.1	B	Pass	19.1	B	Pass
32	6th Street NW & Constitution Avenue NW	42.6	D	Pass	6.1	A	Pass

Notes:
AWSC = All-Way STOP-Controlled unsignalized intersection
EB = Eastbound, WB = Westbound
LOS = Level of Service
Delay is Measured in Seconds Per Vehicle.
Red cells denote intersections operating at unacceptable conditions.

No-action Alternative Operations Analysis

Based on the Synchro™ signalized intersection analysis, the majority of the study intersections would operate at acceptable conditions during the AM and PM peak hours in 2025. However, the intersection of 6th Street NW and Pennsylvania Avenue NW would operate at LOS E during the PM peak hour. This is the only intersection within the study area that would operate under unacceptable conditions during a peak hour period in 2025. None of the study area intersections would operate at LOS F during a peak hour. A total of 13 signalized intersections would experience an unacceptable conditions for one or more turning movements. Compared to the Existing Condition, the No-action Alternative would have no change in the number of intersections failing during the AM peak hour and there would be one more intersection failing during the PM peak hour. The JEH TIA (Appendix B) contains a more detailed No-action Alternative traffic operations analysis.

The overall intersection LOS grades for the No-action Alternative are shown in figure 4-34 for the AM and PM peak hours. Table 4-44 shows the results of the LOS capacity analysis and the intersection projected delay under the No-action Alternative during the AM and PM peak hours.